Web Services Strategy

Agenda

What are Web Services?

Web Services - The Technologies

Web Services Compliments Overall Data Strategy

How does this help Business?

Conclusion

Web Services

A Web Service" is a self-describing, self-containing modular application. The Web Service is descriptive logic that is packaged so that it can be located and invoked programmatically over the Internet using a set of low overhead, open standard network and application protocols (i.e. SOAP, UUDI, XML, etc.)
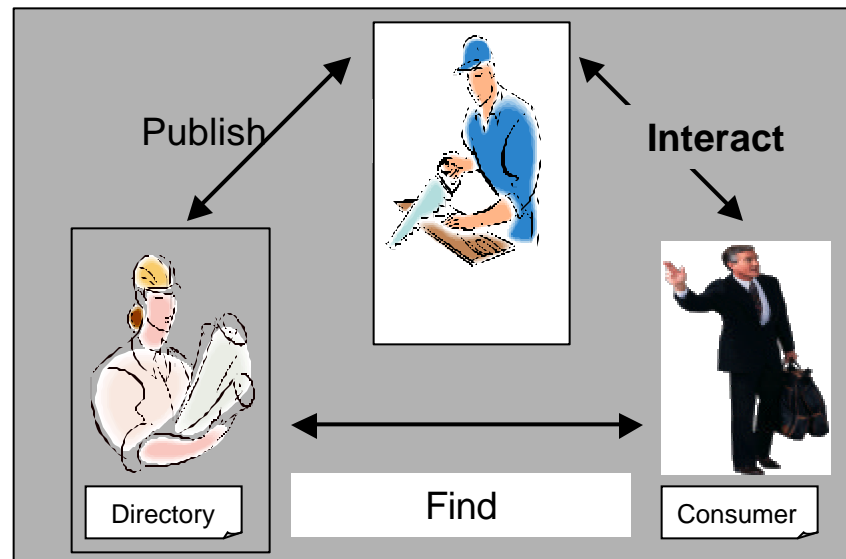
Publish

Interact

Note: The current focus is on the **Interact** component of Web Service using SOAP technology.

Directory

Find

Consumer

Publish & Find	UDDI, WS-Inspection
Interact	SOAP, SwA, ebXML Messaging Service
Define	XML, WSDL, XSD, XSLT
Connect	IP, DNS, URL, HTTP, HTTPS

Web Services Examples

MapQuest offers a Web Services system that allows for flexible integration of the MapQuest search engine on various Web sites.

- Borders provides Web visitors with detailed maps and driving directions for all locations that makes finding the nearest Borders store quick and easy.

- Cendant (parent company to Century21, ERA and Coldwell Banker) taps into powerful mapping engines helping clients locate homes and the nearest realtor office.

- Travelocity.com offers a hotel-booking tool, which enables travelers to search for hotels near a specific location with as much or as little information as is available using the MapQuest search engine.

Web Services Examples

CBS MarketWatch offers a Web Service integration tool through BigCharts.com that allows for flexible use of its Stock Tickers and Market Charts on various Web sites.

- MarketWatch powers the Motley Fool news alerts as part of **www.fool.com**

- Citibank offers CBS MarketWatch news and portfolio tracker on the Citi.com site

- AG Edwards has integrated MarketWatch news and price alerts into the AGe-Connect site.

- CSFBdirect customers are able to access CBS MarketWatch real-time and symbol-specific news, as well as a suite of proprietary market columns via the CSFBdirect portal.

Key Web Services Benefits

- Provide a straightforward, low entry cost mechanism for system-to-system interaction between companies

- Based on a set of industry standard protocols and technologies available on all platforms

- Support the reuse and extension of existing components/applications

- Enables just-in-time integration - allowing disparate business services to be federated into a composite, value-added business function without intervention from a programmer

- Technically enables communication between diverse technologies – within an organization - and externally to trading partners, customers and suppliers

- Web services are *additive*, not necessarily *replacement*, technology

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Core Web Standards

Web Services technologies are driven by standards supported by all vendors to maximize interoperability.

Core Stack
Discovery: UDDI
Description: WSDL
Packaging: HTTP GET/POST, SOAP
Transport: HTTP, HTTPS, SMTP, FTP, Message Queuing…

The core standards are already defined:

Discovery

- Web Services are registered in central registries (UDDI) and can be discovered there

Description

- Web Service provider describes its services with all details via a standard XML document called WSDL

Messaging

- Use of XML as the basis for document centric messaging protocol. SOAP is establishing itself as the foremost message protocol for Web Services
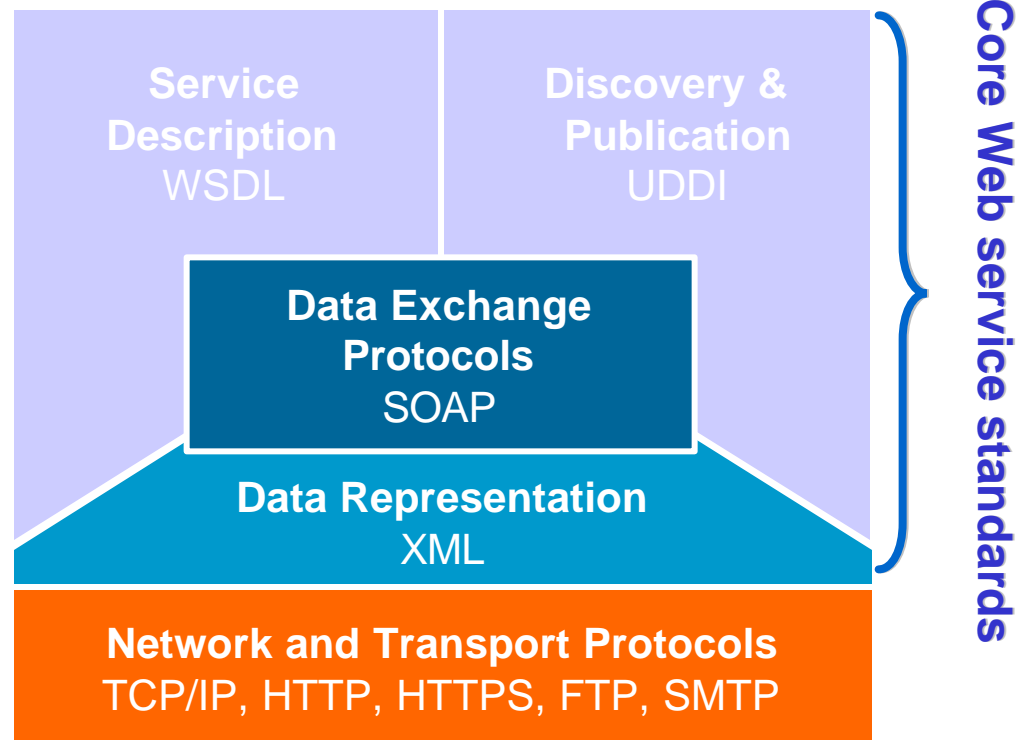
Transport

- Defines the protocols used to transport messages. HTTP is the de facto standard network protocol for Internet-available Web Services

Web Services Technologies

Web Services are a developing capability that build on both existing and new technologies /standards. Rarely is a web service mentioned without discussion of XML. Other protocols such as SOAP are viewed as the most likely standard for wrapping XML - but the technologies are still evolving.

- Web services:
  - are based on Internet standards
  - are platform agnostic
  - are widely available
  - have complete vendor support
  - are a key enabler of SOAs (Service Oriented Architectures)

Service Description WSDL	Discovery & Publication UDDI

Data Exchange Protocols SOAP

Data Representation XML

Network and Transport Protocols TCP/IP, HTTP, HTTPS, FTP, SMTP

Core Web service standards

Web Services - The Technologies in Detail

XML (Extensible Markup Language) - Platform independent, language-neutral data representation format

SOAP (Simple Object Access Protocol) - Lightweight, extensible protocol for information exchange across different systems and protocols. Part of the SOAP specification defines a set of rules for how to use XML to represent data. Other parts of the SOAP specification define an extensible message format, conventions for representing remote procedure calls (RPCs) using SOAP message format, and bindings to the HTTP protocol.

WSDL (Web Service Description Language) - An XML-based contract language that defines a standard mechanism for documenting what messages a Web Service accepts and generates (i.e. interfaces).

UDDI (Universal Description, Discovery, and Integration) - Specifies a mechanism for Web Service providers to advertise the existence of their Web Services and for Web Service consumers to locate Web Services of interest. UDDI Registries offer data, metadata, bindings, pointers, and documents for finding and invoking Web Services that includes client and server APIs for publishing to, editing, and querying registry entries.

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Consistent Data Framework

Access Methods	Internal Data Exchange *(Internal Data Strategy)*	External Data Exchange *(FSA Gateway Strategy)* - SAIG - Web Services	Portals / Websites *(Portal Strategy)* - Schools - Students - Financial Partners
	Data Access Services - EAI - Web Services *(Web Services Strategy)*		
Data Standards	Data Standards - XML - Custom Flat File - EDI		
Data Quality	Data Correction Services - First time data corrections	Reconciliation Services - Repeatable data consistency checks (Person demo data) - Data reconciliation scripts	Audit Services - Cross-system financials checks (Aggregated account balance to detailed trans.)	Analytics - Data Mining - Statistical Analysis
Data Architecture	Security - Authentication - Encryption - Authorization - Access - Privacy	Integrated Data Dictionaries Common Identifiers -Common Student ID - Routing ID Database / Data Warehouse Strategy	Backup, Restore, and Archiving Records / Document Management	XML Vision *(XML Strategy)* Core Components / Sector Libraries / Schemas Registry / Repository
Data Ownership	Data Owner	Data Owner	Data Owner	Data Owner

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Web Services - How do they compliment FSA Strategies?

- Build/Leverage in place XML Schemas

- Ease Data Integration concerns

- Assist in the movement from batch process to web based "real-time" information exchange

- Provide means for accessing FSA internal systems as well as joint development of standards and access with external parties

- Further FSA's ability to match customer expectations - parallel convenience/accessibility of commercial industry

- As Messaging Maturity and Capability increases Web Services are a clear next step

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Possible Business Functions that could be enabled by Web Services

1. Expected Family Contribution (EFC) Calculator

2. Loan Balance Lookup

3. Update Address

4. Get Current Student Address

5. Pay off Calculator

6. Scholarship Search

7. School Search

8. Estimated Cost Calculator (future cost of education)

9. Repayment Calculator

10. R2T4 (Return to Title IV)

Considerations for Web Services

Web Services allow the sharing of information between parties via distinct business functions.

- What business functions could FSA provide to the community?

- What business functions are you currently using with other clients?

- Do you have any lessons learned from pilots or implementations?

- What are the best practices that you have discovered along the way?

Questions

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